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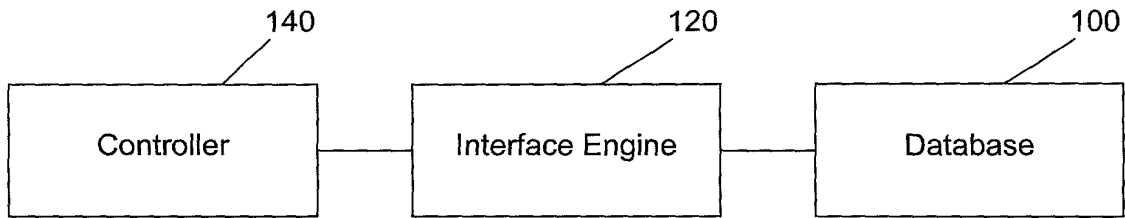


Figure 1(a)

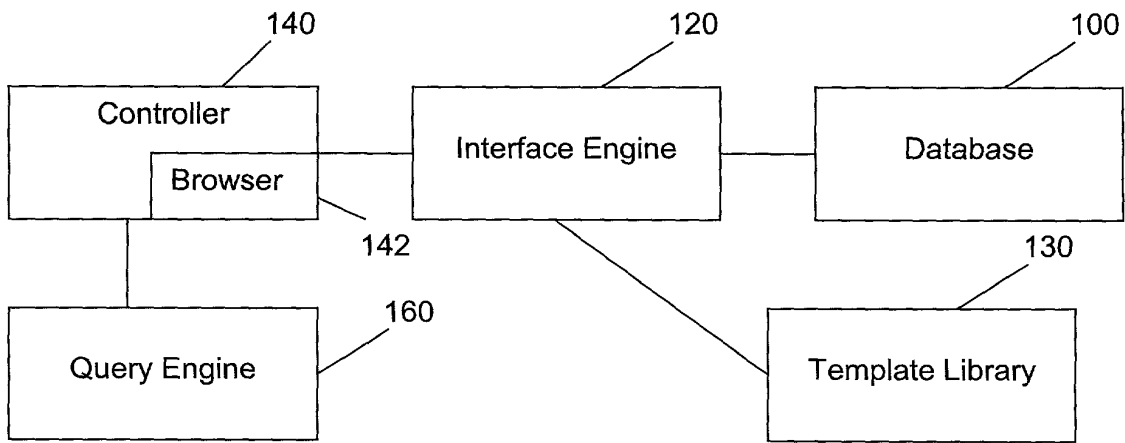


Figure 1(b)

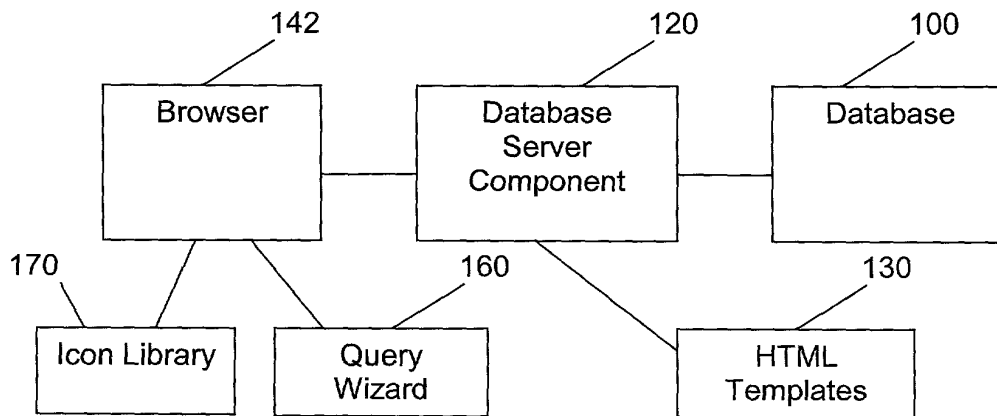


Figure 1(c)

2009220-2128001

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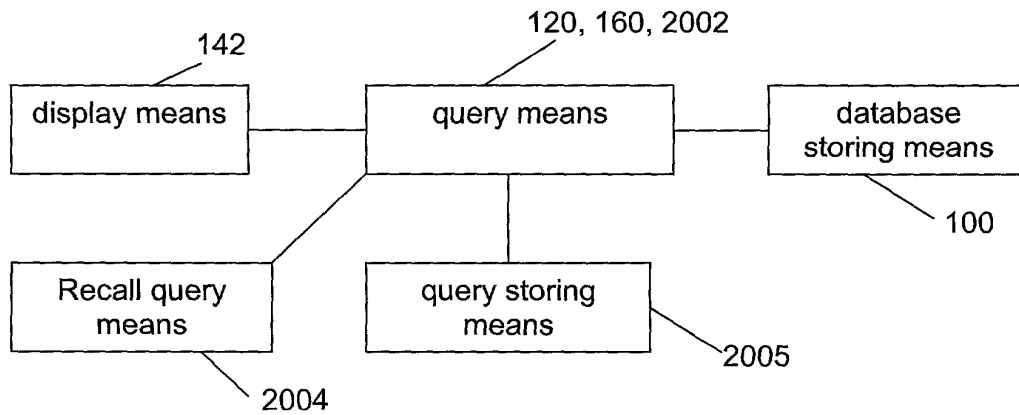


Figure 1(d)

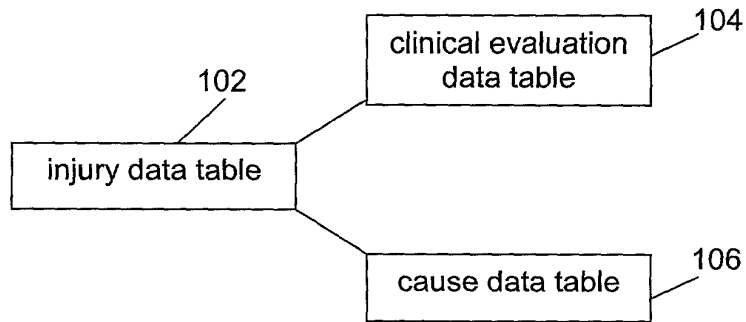


Figure 2(a)

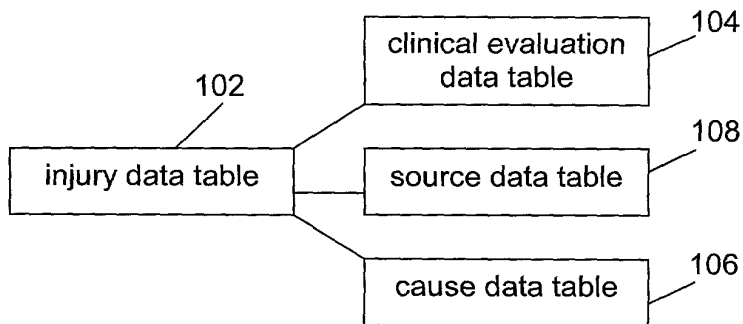


Figure 2(b)

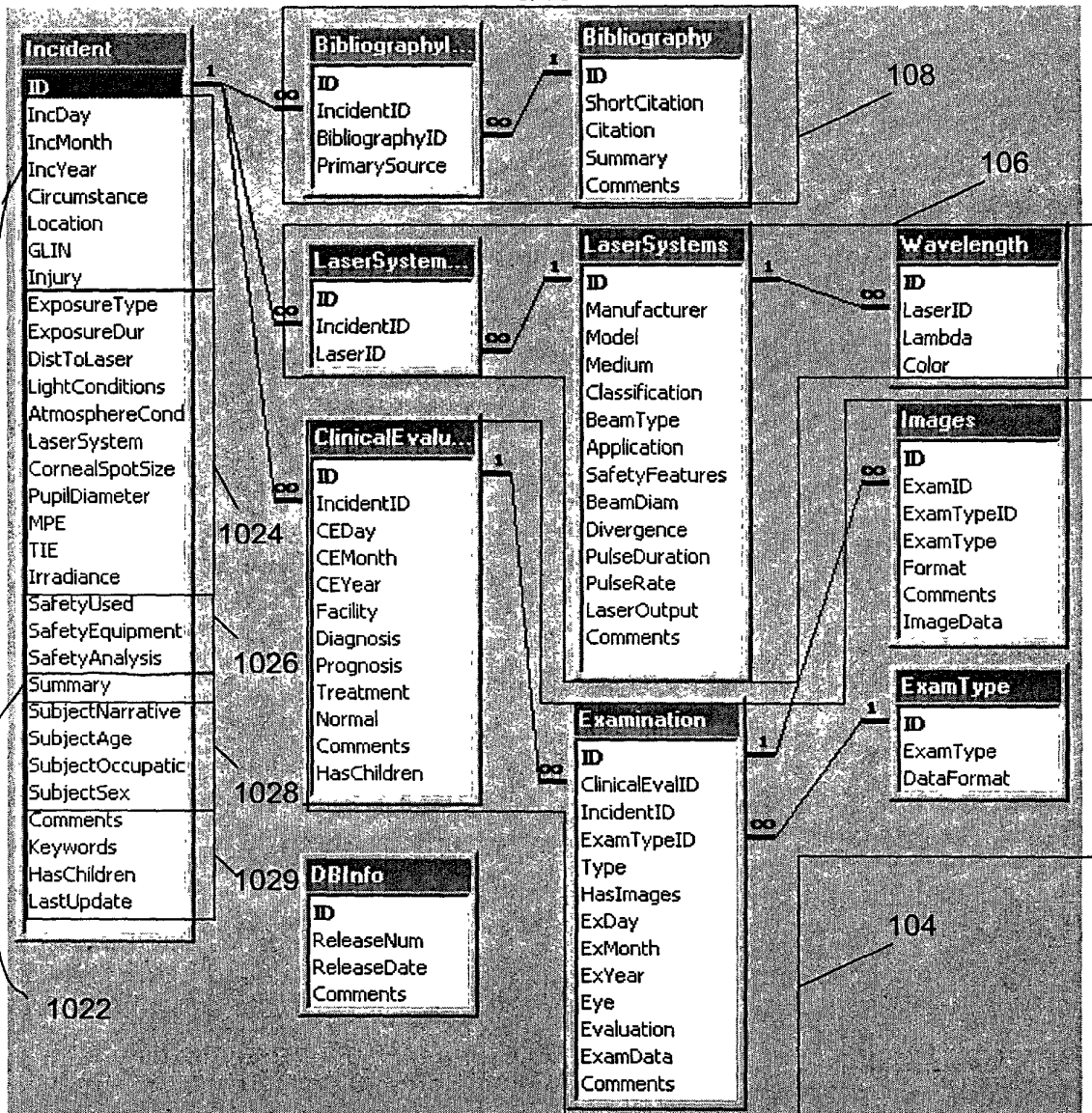


Figure 3

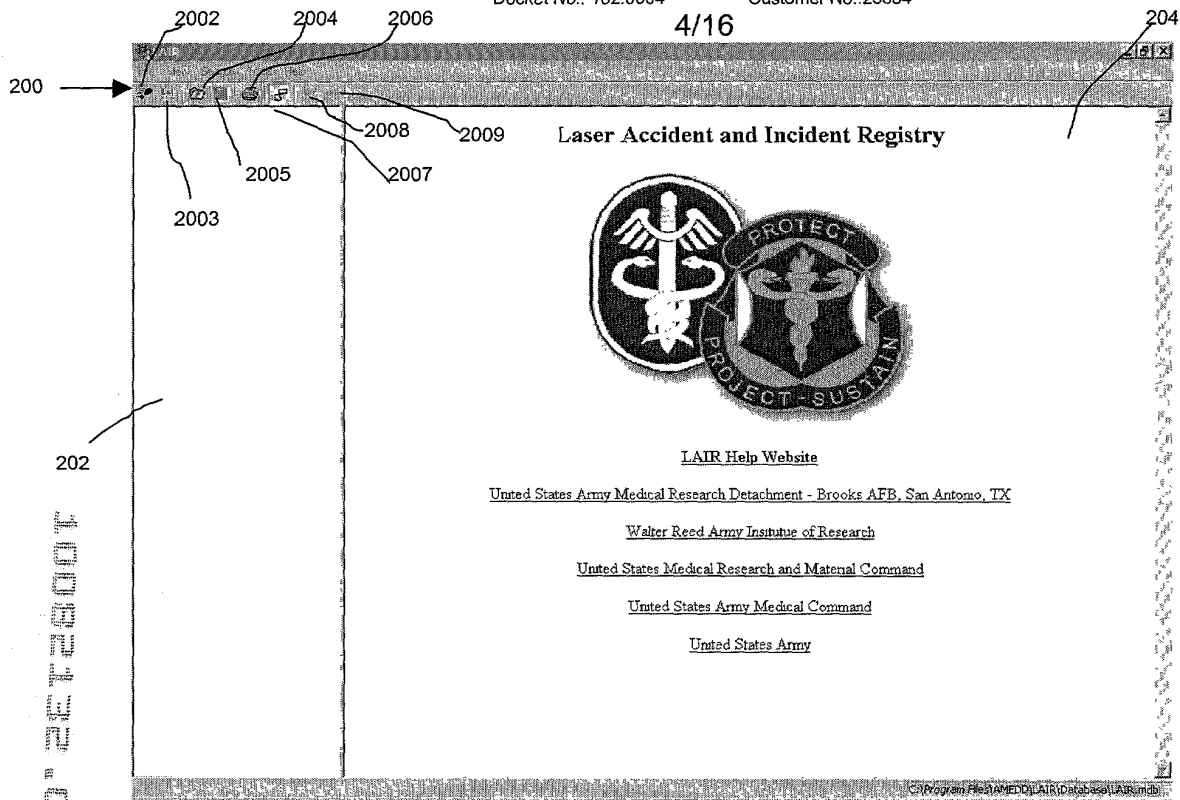


Figure 4

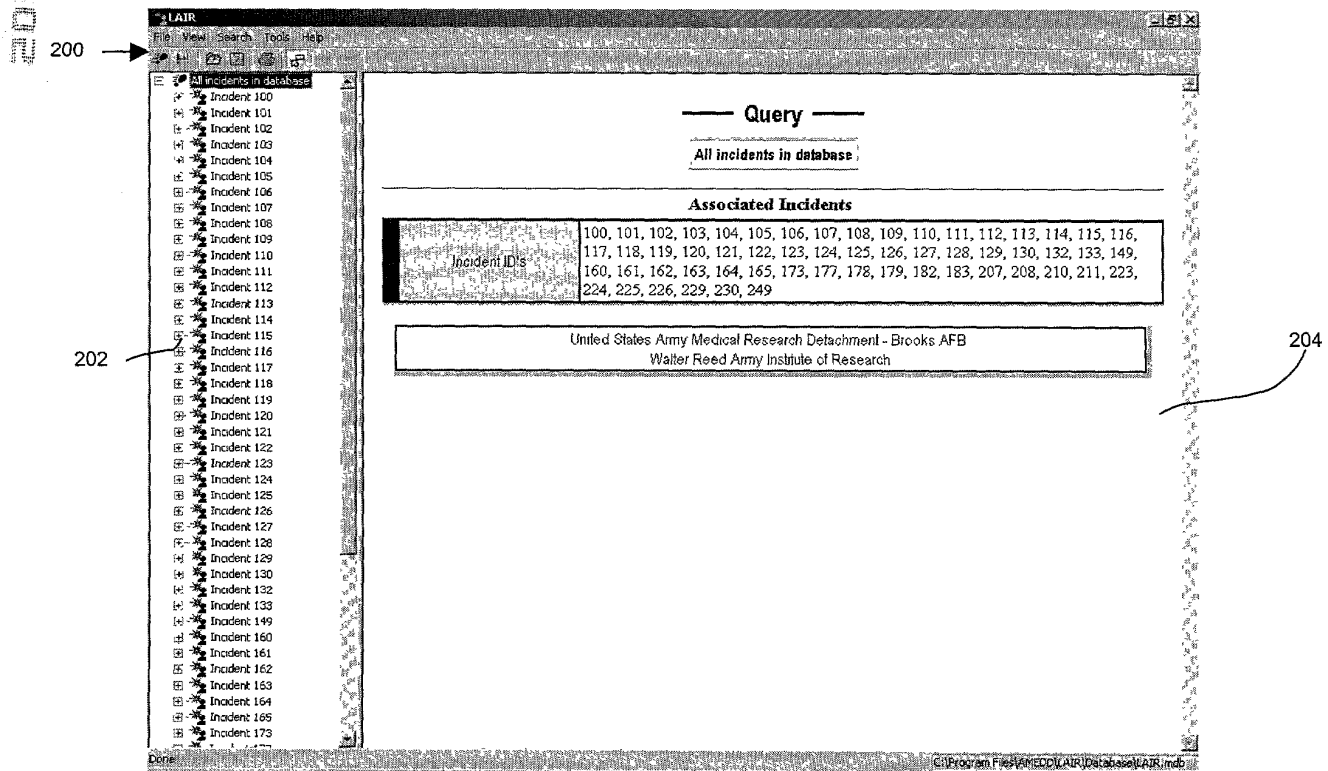


Figure 5

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202

Incident 105
 Incident 106
 Incident 107
 Incident 108
 Incident 109
 Incident 110
 Incident 111
 Incident 112
 Incident 113
 Incident 114
 Incident 115
 Bibliography
 Laser
 Clinical Evaluation 3 Apr 1984
 Visual Acuity 3 Apr 1984
 Ophthalmic Exam 3 Apr 1984
 Fundus Photograph 3 Apr 1984
 Clinical Evaluation 5 Apr 1984
 Visual Acuity 5 Apr 1984
 Ophthalmic Exam 5 Apr 1984
 Clinical Evaluation 9 Apr 1984
 Visual Acuity 9 Apr 1984
 Amster Grid 9 Apr 1984
 Clinical Evaluation 20 Apr 1984
 Amster Grid 20 Apr 1984
 Contrast Sensitivity 20 Apr 1984
 Hundred Hue 20 Apr 1984
 Visual Acuity 20 Apr 1984
 Ophthalmic Exam 20 Apr 1984
 Clinical Evaluation 4 Aug 1984
 Visual Acuity 4 Aug 1984
 Amster Grid 4 Aug 1984
 Contrast Sensitivity 4 Aug 1984
 Ophthalmic Exam 4 Aug 1984
 Incident 116
 Incident 117
 Incident 118
 Incident 119
 Incident 120
 Incident 121
 Incident 122

Incident

Incident 115 Summary Exposure Safety Subject

Summary top

IGLUN	4
Summary	The soldier entered a barracks room of his friends and looked around the room. He realized that he was looking down the tube of a laser rangefinder. His friends had been pointing the device at the door coincident to his looking into the room. He noticed the bright white flash immediately and attempted to look away from the source and covered his eyes with his hands. When he uncovered his eyes he noticed a red globular haze in the vision of his right eye that he interpreted as blood. He attempted to wash his eye with no success. His eye appeared normal at a glance. He later noticed a dark spot in the vision of his right eye, slightly below and to the right of fixation.
Laser System	Q-switched Nd:YAG
Injury	Retinal necrosis, subretinal hemorrhage, vitreous hemorrhage, and strabismic retinopathy
Comments	The laser emitted at 1,064 nm and operated at 10 Hz, with a pulse duration of 20ns. The nominal output was 50 mJ. Assuming the pupil size was between 4 and 5 mm at the time of injury, the TIE was between 500 and 800 micro J.

Exposure top

Date	3 Apr 1984
Circumstances	Accidental encounter
Location	Barracks room
Exposure Duration	
Exposure Type	

Distance to Laser (meters) 15.42 m

Done

C:\Program Files\AMEDD\LAIR Database\LAIR.mdb

Figure 6(a)

LAIR

File View Search Tools Help

Examinations: Clinical Evaluation Facility Includes

Incident 115
 Incident 210
 Visual Functions: E
 Incident 207

Incident 115
 3 Apr 1984
 Accidental encounter
 Q-switched Nd:YAG
 Retinal necrosis, subretinal hemorrhage, vitreous hemorrhage, and strabismic retinopathy

Laser Accident and Incident Registry

PROTECT
 PROJECT-SUSTAIN

LAIR Help Website

United States Army Medical Research Detachment - Brooks AFB, San Antonio, TX

Walter Reed Army Institute of Research

United States Medical Research and Materiel Command

United States Army Medical Command

United States Army

C:\Program Files\AMEDD\LAIR Database\LAIR.mdb

Figure 7

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Incident	
Incident 115	Summary
<u>Summary log</u>	
GLIN	4
Summary	The soldier entered a barracks room of his friends and looked around the room. He realized that he was looking down the tube of a laser rangefinder. His friends had been pointing the device at the door coincident to his looking into the room. He noticed the bright white flash immediately and attempted to look away from the source and covered his eyes with his hands. When he uncovered his eyes he noticed a red globular haze in the vision of his right eye that he interpreted as blood. He attempted to wash his eye with no success. His eye appeared normal at a glance. He later noticed a dark spot in the vision of his right eye, slightly below and to the right of fixation.
Laser System	Q-switched Nd:YAG
Injury	Retinal necrosis, subretinal hemorrhage, vitreous hemorrhage, and striate retinopathy
Comments	The laser emitted at 1.064 μm and operated at 10 Hz, with a pulse duration of 20ns. The nominal output was 50 mJ. Assuming the pupil size was between 4 and 5 mm at the time of injury, the TIE was between 500 and 800 micro J.
<u>Exposure log</u>	
Date	3 Apr 1984
Circumstances	Accidental encounter
Location	Barracks room
Exposure Duration	
Exposure Type	
Distance to Laser (meters)	5.48 m
Corned Spot Size (mm)	4×10^{-1} mm
Pupil Diameter (mm)	
Atmospheric Conditions	
Ambient Lighting Conditions	
Irradiance	
Total Intra-ocular Energy (J/cm^2)	
Maximum Permissible Exposure Limit (J/cm^2)	
<u>Safety log</u>	
Safety Equipment	
Safety Used	No
Safety Analysis	
<u>Subject log</u>	
Subject Report	Upon entering the room, the soldier immediately noticed a bright white flash that pulsed 'like a strobe'. He remembers hearing a whirring noise coming from the room just prior to his entering the room.
Sex	Male
Age	22
Occupation	Soldier
Keywords: LASER, RETINA, VITREOUS HEMORRHAGE, INJURY, PHOTOCOAGULATION, LASER ACCIDENT, MILITARY, INDOOR, DESIGNATOR.	

Figure 6(b)

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<div style="border: 1px solid black; display: inline-block; padding: 2px 10px;">Incident 115</div>	
Sources	
Sources	<div style="border: 1px solid black; padding: 5px;"> <p>Kearney 1987 Kearney, J.J., Cohen, H.B., Stuck, B.E., Rudd, G.P., Beresky, D.E., Wertz, F.D., 'Laser injury to multiple retinal foci.' Lasers in Surgery and Medicine 7, pp 499-502 (1987)</p> <p>Kearney 1985 Kearney J. J., Stuck, B. E., Zwick, H., Keller, J. B. 'James Johnson: Clinical Summary' (unpublished notes). Presidio of San Francisco: Letterman Army Institute of Research, April 1884 - January 1985</p> <p>Stuck 1996 Stuck, B.E., Zwick, H., Molchany, J., Lund, D.J., Gagliano, D.A., 'Accidental human laser retinal injuries from military laser systems,' SPIE, Proceedings of Laser-Inflicted Eye Injuries: Epidemiology, Prevention, and Treatment, Vol. 2674, pp 7-20 (1996)</p> </div>
top	

Figure 6(c)

<div style="border: 1px solid black; display: inline-block; padding: 2px 10px;">Lasers referenced in Incident 115</div>	
Laser Systems	
Laser Information	<div style="border: 1px solid black; padding: 5px;"> <p>(Unspecified) Q-Switched Nd:YAG</p> <p>Pulsed, Nd:YAG</p> <p>Wavelength(s): 1.064 μm</p> <p>Comments: See Incident Summary and Comments for details</p> </div>

Figure 6(d)

209220-2ET280Y

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Clinical Evaluation	
Incident 115 Summary Comments	
help	
Summary top	
Date	3 Apr 1984
Abnormal Results	Abnormal visual functions
Diagnosis	Visual acuity OD 20/400, a small vitreous hemorrhage, plus three visible retinal lesions. Visual acuity OS 20/20
Treatment	Corticosteroids in the form of dexamethasone IV 10 mg initially and 4mg every 6 h for 48 h.
Prognosis	
Facility	Emergency Room
Comments top	
Exam Details Available	Yes
Comments	Patient was examined at emergency room shortly after injury.

Figure 6(e)

Examination	
Incident 115 / Clinical Evaluation 208	
Exam Type: Ophthalmic Exam	
Summary Results	
Summary top	
Date	29 Apr 1984
Eye	OU
Evaluation	All exams in the left eye were normal. Right eye - A small inferior vitreous hemorrhage was evident. Three foci of retinal injury with whitening of retina, retinal defect and subretinal blood were present. The foci were arrayed on a line and were equally spaced
Results top	
Notes and Observations	OU: In addition to the specific exams reported, additional exams were performed on the patient. Farnsworth D-15 and Desaturated Farnsworth D-15 were normal for both eyes. Stereo acuity - 80 seconds of arc, normal indicating that the patient had retained binocularity in the foveal areas of the retina. Dark adaptometry - elevated threshold in the right eye compared to the left eye, but at upper limit of normal. Fluorescein angiography - retinal, retinal pigment epithelial and choroidal ruptures present; subretinal blood evident in the right eye. Electrophysiology - normal electroretinogram, electrooculogram, and visual evoked cortical potential

Figure 6(g)

Examination	
Incident 115 / Clinical Evaluation 205	
Exam Type: Visual Acuity	
Summary Results	
Summary top	
Date	3 Apr 1984
Eye	OD, OS
Evaluation	
Results top	
Measured Acuity	OD: Snellen, 20/400 OS: Snellen, 20/20

Figure 6(h)

20220722 22:22:00

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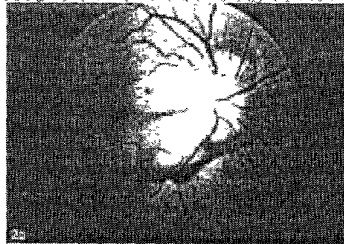

<div style="border: 1px solid black; display: inline-block; padding: 2px 10px;">Examination</div>	
<div style="border: 1px solid black; display: inline-block; padding: 2px 10px;">Incident 115 / Clinical Evaluation 205</div>	
<div style="border: 1px solid black; display: inline-block; padding: 2px 10px;">Exam Type: Fundus Photograph</div>	
<div style="display: flex; justify-content: space-around; border: 1px solid black;"> Summary Results Images </div>	
Summary <small>top</small>	
Date	3 Apr 1984
Eye	OD
Evaluation	<p>Examination of the right eye showed a visual acuity of 20/400, a small vitreous hemorrhage, plus three visible retinal lesions. One lesion was located slightly superior and nasal to the fovea centralis. A second was at the superior aspect of the optic disk. The perifoveal lesion was most prominent, whereas the one superonasal to the optic disk was least prominent. Each lesion was accomplished by varying degrees of subretinal hemorrhage. It was interesting to note that the three lesions defined a straight line and were equally spaced, attesting to the repetitive pulse nature of the laser instrument. The remainder of the examination of the right eye and the examination of the left eye were normal.</p>
Results <small>top</small>	
Dyes used	
Images <small>top</small>	
Images	<p>Fundus photo taken the same day as the injury.</p>  <p>Taken the day of the injury</p> 

Figure 6(f)

10062432.022600

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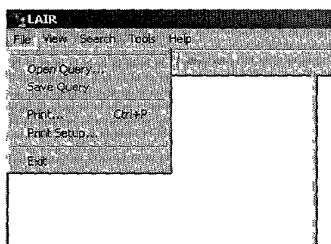


Figure 8(a)

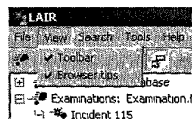


Figure 8(b)

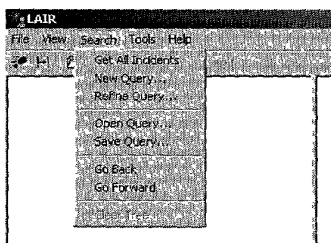


Figure 8(c)

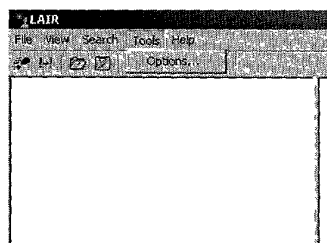


Figure 8(d)

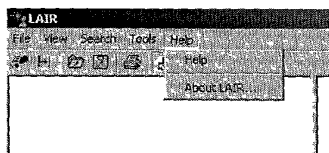


Figure 8(e)

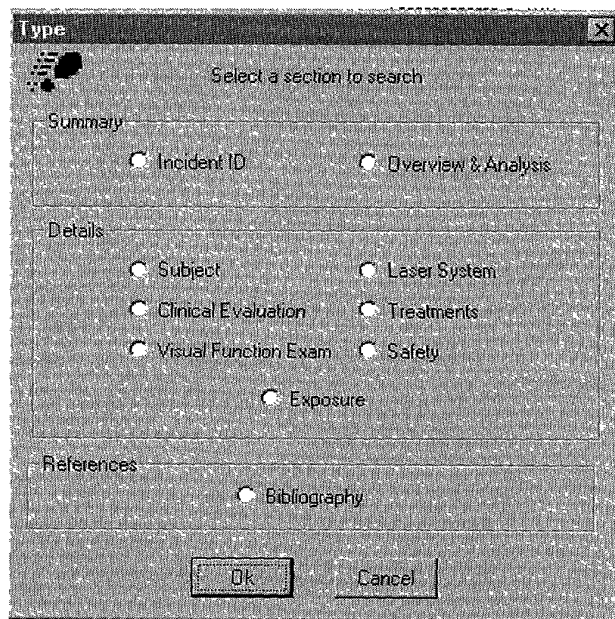


Figure 11(a)

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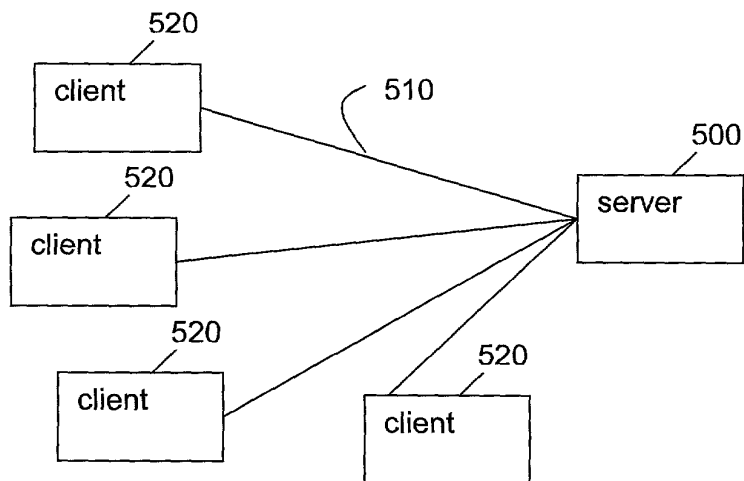


Figure 9

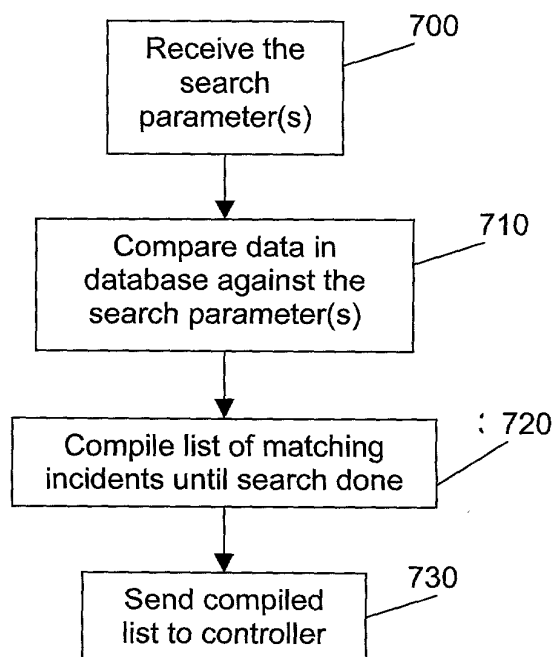


Figure 10(b)

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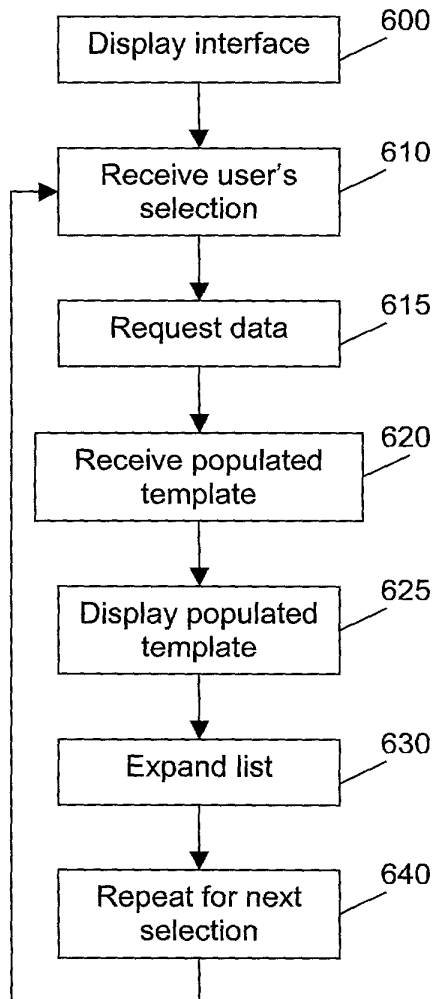


Figure 10(a)

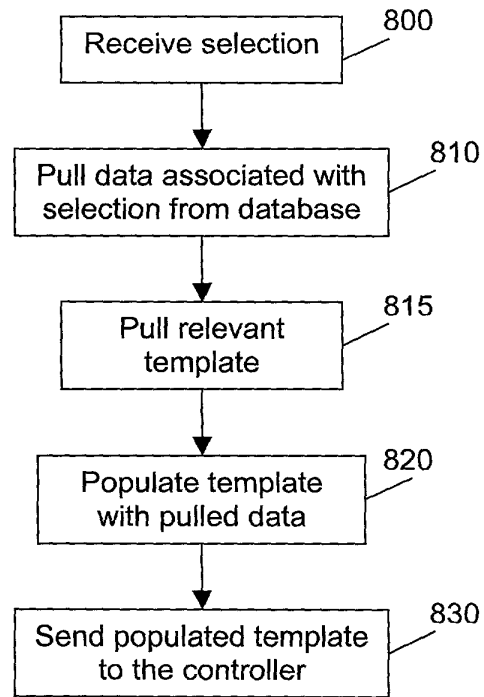


Figure 10(c)

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Overview and Analysis

Analysis: CLIN

Overview

Abstract / Summary	Subjects Narrative	Circumstances	Location of Incident	Injury	Comments	Keywords

Incident Date

Day: [] Month: [] Year: []

OK Cancel

Figure 11(b)

Subject Query

Age	Sex	Occupation
= equal to		containing

OK CANCEL

Figure 11(c)

Laser System

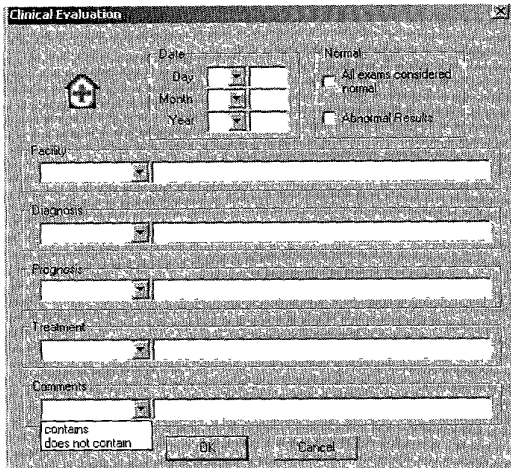
Hardware	Model	Medium	Application	Safety Features	Classification	Wavelength (um) - microns	Beam Type
Manufacturer							Beam Diameter
							Pulse Duration (Seconds)
							Pulse Rate (Hz)
							Output (Watts)
							Divergence (mrad)
							Beam Type
							Continuous Wave (CW)
							Pulsed
							Filter

OK Cancel

Figure 11(d)

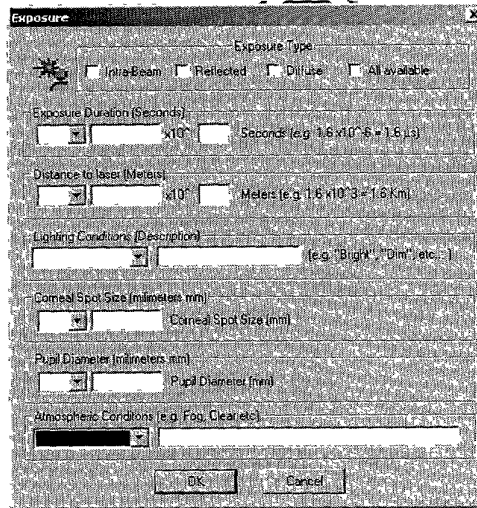
20220721 10:00:13.02602

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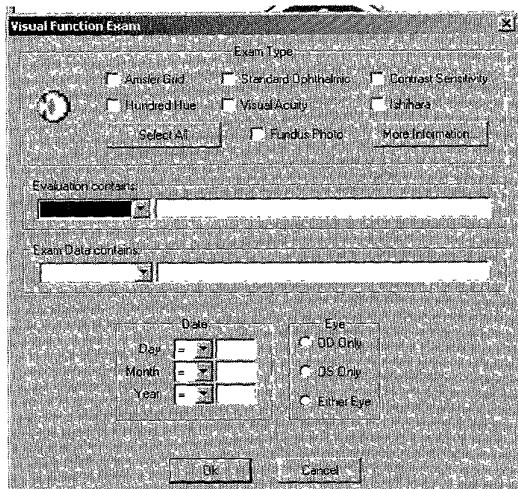
The 'Clinical Evaluation' dialog box contains a home icon, a date selector (Day, Month, Year), and checkboxes for 'Normal' (All exams considered normal), 'Abnormal Results', 'Facility', 'Diagnosis', 'Prognosis', 'Treatment', and 'Comments'. The 'Comments' field has a dropdown menu with 'contains' and 'does not contain' options. 'OK' and 'Cancel' buttons are at the bottom.

Figure 11(e)



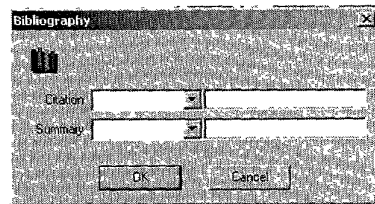
The 'Exposure' dialog box includes an 'Exposure Type' section with checkboxes for 'Intra-Beam', 'Reflected', 'Diffuse', and 'All available'. It features input fields for 'Exposure Duration (Seconds)' (with a multiplier of $\times 10^{\text{seconds}}$), 'Distance to laser (Meters)' (with a multiplier of $\times 10^{\text{meters}}$), 'Lighting Conditions (Description)' (with a multiplier of $\times 10^{\text{lighting}}$), 'Corneal Spot Size (millimeters mm)' (with a multiplier of $\times 10^{\text{corneal}}$), 'Pupil Diameter (millimeters mm)' (with a multiplier of $\times 10^{\text{pupil}}$), and 'Atmospheric Conditions (e.g. Fog, Clear, etc.)'. 'OK' and 'Cancel' buttons are at the bottom.

Figure 11(h)



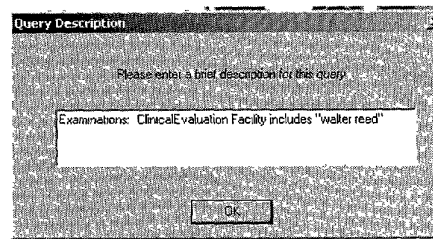
The 'Visual Function Exam' dialog box has an 'Exam Type' section with checkboxes for 'Amesler Grid', 'Standard Optometric', 'Contrast Sensitivity', 'Hundred Hue', 'Visual Acuity', 'Lightbars', 'Select All', 'Fundus Photo', and 'More Information'. It includes 'Evaluation contains' and 'Exam Data contains' dropdown menus. A date selector (Day, Month, Year) and an 'Eye' section with radio buttons for 'OD Only', 'OS Only', and 'Either Eye' are also present. 'OK' and 'Cancel' buttons are at the bottom.

Figure 11(f)



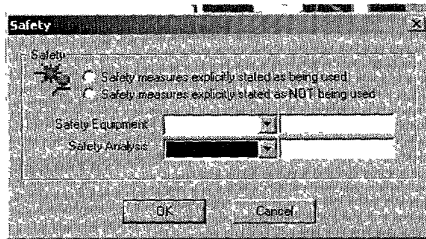
The 'Bibliography' dialog box contains a 'Citation' dropdown menu and a 'Summary' text field. 'OK' and 'Cancel' buttons are at the bottom.

Figure 11(i)



The 'Query Description' dialog box prompts the user to 'Please enter a brief description for this query'. It features a text field containing the text 'Examinations: ClinicalEvaluation Facility includes "walker read"'. An 'OK' button is at the bottom.

Figure 11(j)



The 'Safety' dialog box includes a 'Safety' section with radio buttons for 'Safety measures explicitly stated as being used' and 'Safety measures explicitly stated as NOT being used'. It also has 'Safety Equipment' and 'Safety Analysis' dropdown menus. 'OK' and 'Cancel' buttons are at the bottom.

Figure 11(g)

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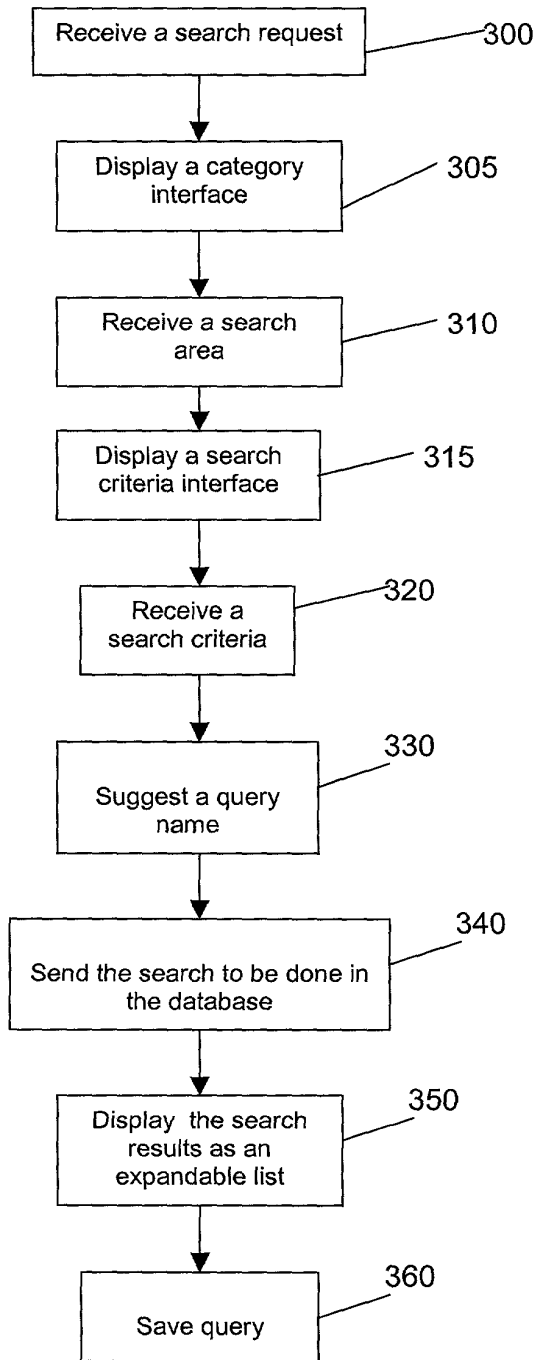


Figure 12

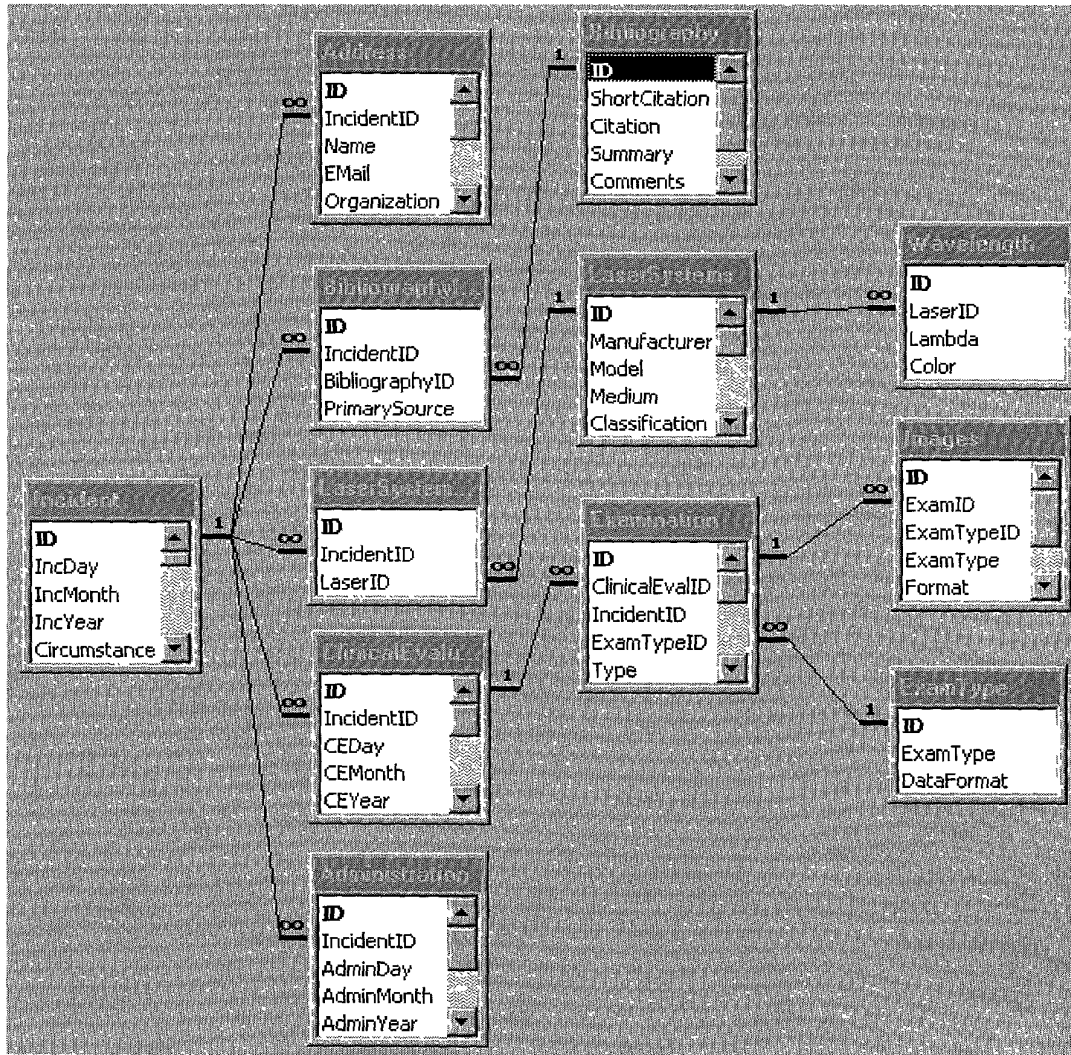


Figure 13